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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Christian Pacha

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DICKSTEIN SHAPIRO LLP

1177 AVENUE OF THE AMERICAS 6TH AVENUE

NEW YORK, NY 10036-2714

EXAMINER

LAM, TUAN THIEU

ART UNIT

PAPER NUMBER

2816

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/723,309	Applicant(s) PACHA ET AL.	
	Examiner Tuan T. Lam	Art Unit 2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-32,34-37 and 39-53 is/are pending in the application.
- 4a) Of the above claim(s) 26 and 51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25,27-32,34-37,39-50,52 and 53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/18/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is a response to the amendment filed 8/14/2008. Claims 25, 27-32, 34-37, 39-50 and 52-53 are under examination. Claims 26 and 51 have been withdrawn from consideration.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 25, 27-32, 34-37, 39-50 and 52-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 29, 52 and 53, the recitation of “if” in line 7, “can no longer” in line 19 is not a positive recitation. It can not be determined if the condition will occur. It is suggested to change “if” to --when-- and delete "can".

Claims 25, 27-28, 30-32, 34-37 and 39-50 are also indefinite because of the technical deficiencies of claims 29, 52 and 53.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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2. Claims 25, 27-29, 34-37 and 45-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Inukai et al. (Boosted Gate MOS (BGMOS): Device/Circuit Cooperation Scheme to Achieve Leakage-Free Giga-Scale Integration), prior art of record.

Figure 9 of Inukai et al. shows a circuit arrangement comprising an edge triggered flip flop comprising a storage flip flop (six thick gate transistor on the right hand side) having a plurality of storage transistors with a threshold voltage of a first value (high threshold), a first power switch transistor (transistor receiving Standby signal) having a second threshold voltage (high threshold), wherein an application of a predetermined electrical potential (Standby signal) to the first power switch transistor gate terminal brings the circuit arrangement to an operating state (standby mode) in which if at least one supply voltage(VSS) is switched off, electric charge carriers (leakage current) contained in the circuit arrangement are prevented from discharged from the circuit arrangement, and a plurality of switching transistors (transistors within the set reset crossed coupled NAND gates), having a threshold voltage of a third value, provided between the flip flop and the first power switch transistor, for coupling the flip flop input signal (D) into the flip flop, wherein the magnitude of the first and/or second value is greater than the magnitude of the third value (high threshold voltage is larger than the low threshold voltage), wherein each one of the terminals of the switching transistors has a defined electrical potential in the operating state (in the standby mode, the source, drain and gate terminals of the switching transistors have a defined electrical potential), a pulse generator circuit (the circuit to the left of the crossed coupled NAND gates) that generates a flip flop input signal from an input signal (D) and from a clock signal (CLK) and is coupled to the first power switch transistor and to the switching transistor, wherein the pulse generator circuit is configured such that the flip flop input

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signal is precharged to a first electrical potential during a precharging clock signal phase, that the flip flop input signal is brought to a second electrical potential by a rising clock edge following the precharging clock signal phase, and that the state of the flip input signal can no longer be altered after the rising clock edge as called for in claim 29.

Regarding claim 25, the storage flip flop has two crossed coupled inverters.

Regarding claim 27, since the storage and the first power switching transistors have a higher threshold voltage, the thickness of the gate insulating layer of the storage transistors and the first power switch transistor is greater than the thickness of the gate insulating layer of the switching transistors.

Regarding claim 28, since the storage transistor and the first power switching transistor have a higher threshold voltage, the channel width of the storage transistors and the first power switch transistor is less than the thickness of the gate insulating layer of the switching transistors.

Regarding claims 34-37, figure 9 shows the pulse generator comprises inverters having transistors with low threshold voltages.

Regarding claims 45-50, figure 9 shows the protection transistors (transistors receiving WL signal) having high threshold voltage.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 30-32 and 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inukai et al. (Boosted Gate MOS (BGMOS): Device/Circuit Cooperation Scheme to Achieve Leakage-Free Giga-Scale Integration) in view of Matsuzaki et al. (USP 6,500,715).

Inukai et al. reference discloses an circuit arrangement having all the aspects of the present invention as noted in claim 29 except for a second power switch transistor coupled to the switching transistor as called for in claims 30-32 and 52-53.

Matsuzaki et al. reference figure 4 shows a power switch transistor (MN1/MP1) connected between a logic circuit having a plurality of switching transistors (TP1, TN1) and power supply. Such an arrangement is used to eliminate leakage current thus reducing power consumption (column 16, lines 19-67; column 20, lines 1-30). Therefore, it would have been obvious to person skilled in the art at the time the invention was made to include an additional power transistor between the GNDV of a crossed coupled NAND gate which having a plurality of transistors and the power supply (ground potential) for the purpose of reducing power consumption.

5. Claims 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inukai et al. (Boosted Gate MOS (BGMOS): Device/Circuit Cooperation Scheme to Achieve Leakage-Free Giga-Scale Integration) in view of Sani et al. (USP 6,794,914).

Inukai et al. reference discloses an circuit arrangement comprising all the aspects of the present invention as noted in the above except for the test circuit coupled to the flip flop for testing the functionality of the flip flop as called for in claim 39.

Sani et al. shows a flip flop having a test circuit (310 of figure 3) to test and to enhance the reliability of the flip flop. Therefore, it would have been obvious to a person skilled in the art at the time the invention was made to include Sani et al.'s test circuit in the circuit arrangement of Inukai et al. for purpose of enhancing the reliability of the flip flop.

Regarding claim 40, the combination of Inukai et al. and Sani et al. show the test circuit comprising a test input signal (Sin), output components (output of the flip flop) that reads a test output signal of the flip flop.

Regarding claim 41, the combination of Inukai et al. and Sani et al. show the test circuit comprising a plurality of transistors (322, 324) having a high threshold voltage.

Regarding claim 42, since test transistors have a higher threshold voltage than the threshold voltage of the switching transistors, the thickness of the gate insulating layer of the test transistors are greater than the thickness of the gate insulating layer of the switching transistors.

Regarding claims 43-44, since test transistors have a higher threshold voltage than the threshold voltage of the pulse generator's transistors, the thickness of the gate insulating layer of the test transistors are greater than the thickness of the gate insulating layer of the pulse generator's transistors.

6. Claims 25, 27-32, 34-37 and 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oklobdzija et al. (USP 6,232,810) in view of Matsuzaki et al. (USP 6,500,715).

Figure 6 of Oklobdzija et al. shows a circuit arrangement comprising an edge triggered flip flop comprising a storage flip flop (32) having a plurality of storage transistors with a threshold voltage of a first value (3.2 micron, high threshold), and a plurality of switching

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transistors (34, 36) having a threshold voltage of a third value (16micron), wherein each one of the terminals of the switching transistors has a defined electrical potential in the operating state, a pulse generator circuit (101) that generates a flip flop input signal from an input signal (D) and from a clock signal (CLK) and is coupled to the switching transistor, wherein the pulse generator circuit is configured such that the flip flop input signal is precharged to a first electrical potential during a precharging clock signal phase, that the flip flop input signal is brought to a second electrical potential by a rising clock edge following the precharging clock signal phase, and that the state of the flip input signal can no longer be altered after the rising clock edge.

What not shown in Oklobdzija et al.'s figure 6A is the high threshold voltage power switch couple/decouple the pulse generator to/from the ground potential in response to a standby signal as called for in claim 29.

Matsuzaki et al. reference figure 4 shows a high threshold voltage power switch transistor (MN1/MP1) couple/decouple a logic circuit having a plurality of switching transistors (TP1, TN1) to/from a power supply/ground potential. Such an arrangement is used to eliminate leakage current thus reducing power consumption (column 16, lines 19-67; column 20, lines 1-30). Therefore, it would have been obvious to person skilled in the art at the time the invention was made to include a high threshold power transistor for coupling/decoupling the pulse generator of Oklobdzija et al. to/from the power supply/ground responsive to a standby signal for the purpose of reducing power consumption.

Regarding claim 25, the storage flip flop has two crossed coupled inverters.

Regarding claim 27, since the storage and the first power switching transistors have a higher threshold voltage, the thickness of the gate insulating layer of the storage transistors and the first power switch transistor is greater than the thickness of the gate insulating layer of the switching transistors.

Regarding claim 28, since the storage transistor and the first power switching transistor have a higher threshold voltage, the channel width of the storage transistors and the first power switch transistor is less than the thickness of the gate insulating layer of the switching transistors.

Regarding claims 34-37, figure 9 shows the pulse generator comprises inverters having transistors with low threshold voltages.

Regarding claims 30-32 and 52-53, figures 16 and 17 of Matsuzaki et al. reference teaches that leakage current in a logic circuit can be reduced by implementing a power switch in either configuration. Therefore, it would have been obvious to person skilled in the art at the time the invention was made to include an additional power transistor for coupling/decoupling the switching transistors of Oklobdzija et al. reference to/from the power supply for the purpose of reducing power consumption.

7. Claims 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oklobdzija et al. (USP 6,232,810) in view of Matsuzaki et al. (USP 6,500,715) in further view of Sani et al. (USP 6,794,914).

The combination of Oklobdzija et al. and Matsuzaki et al. references discloses an circuit arrangement comprising all the aspects of the present invention as noted in the above except for the test circuit coupled to the flip flop for testing the functionality of the flip flop as called for in claim 39.

Sani et al. shows a flip flop having a test circuit (310 of figure 3) to test and to enhance the reliability of the flip flop. Therefore, it would have been obvious to a person skilled in the art at the time the invention was made to include Sani et al.'s test circuit in the circuit arrangement of Oklobdzija et al. And Matsuzaki et al. references for purpose of enhancing the reliability of the flip flop.

Regarding claim 40, the combination of Oklobdzija et al., Matsuzaki et al. and Sani et al. references show the test circuit comprising a test input signal (Sin), output components (output of the flip flop) that reads a test output signal of the flip flop.

Regarding claim 41, the combination of Oklobdzija et al., Matsuzaki et al. and Sani et al. references show the test circuit comprising a plurality of transistors (322, 324) having a high threshold voltage.

Regarding claim 42, since test transistors have a higher threshold voltage than the threshold voltage of the switching transistors, the thickness of the gate insulating layer of the test transistors are greater than the thickness of the gate insulating layer of the switching transistors.

Regarding claims 43-44, since test transistors have a higher threshold voltage than the threshold voltage of the pulse generator's transistors, the thickness of the gate insulating layer of the test transistors are greater than the thickness of the gate insulating layer of the pulse generator's transistors.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Lam whose telephone number is 571-272-1744. The examiner can normally be reached on Monday to Friday (7:30 am to 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 571-272-1988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan T. Lam/
Primary Examiner, Art Unit 2816

9/2/2008